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Abstract

Traumatic amputations involving the upper limb can be a catastrophic injury with significant short and long-term consequences for patients. Upper limb injuries can have a profound impact of patient's quality of life and have a large impact in the patient's ability to perform activities of daily living (ADLs). A rare cause of traumatic amputations is major self-mutilation. Major self-mutilation is usually a devastating complication of severe mental health issues, with most people who inflict major self-mutilation having a psychotic disorder. We present a case of a self-inflicted traumatic hand amputation associated with an acute psychotic episode. The case shows the difficult decision that has to be made whether to perform a replantation or not. It also discusses gaining consent in a psychotic patient. The case highlights how timely communication between different medical specialists and sites can lead to good outcomes for patients.

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CASE REPORTS

Major self-mutilation leading to complete amputation of the hand during an acute psychotic episode

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ABSTRACT

Traumatic amputations involving the upper limb can be a catastrophic injury with significant short and long-term consequences for patients. Upper limb injuries can have a profound impact of patient's quality of life and have a large impact in the patient's ability to perform activities of daily living (ADLs). A rare cause of traumatic amputations is major self-mutilation. Major self-mutilation is usually a devastating complication of severe mental health issues, with most people who inflict major self-mutilation having a psychotic disorder. We present a case of a self-inflicted traumatic hand amputation associated with an acute psychotic episode. The case shows the difficult decision that has to be made whether to perform a replantation or not. It also discusses gaining consent in a psychotic patient. The case highlights how timely communication between different medical specialists and sites can lead to good outcomes for patients.

Key Words: Amputation, Psychosis, Major self-mutilation, Replantation

1. INTRODUCTION

Traumatic amputation involving the upper limb can be catastrophic with significant short and long-term consequences for patients.^[1] Loss of a limb has devastating ramifications to an individual's social, physical and emotional well being, severely affecting the person's activities of daily living (ADLs), employment skills, and recreational activities.^[2,3]

A rare cause of traumatic amputations is self-mutilation.^[4] Self-mutilation is defined as the direct and deliberate self-destruction of a part of a person's body without the intention of suicide. There are both minor and major self-mutilation injuries. Minor self-mutilation is an injury that does not lead to significant disability and is relatively common. Major self-mutilation is an injury that leads to significant disability. These latter types of injuries are rare and generally occur in

association with severe mental illness. They often result in permanent loss of an organ or its function.^[5,6]

Self-mutilation resulting in an amputated extremity is rare. They lead to a difficult decision for the treating doctors as evidence shows that favourable functional outcomes post replantation requires good postoperative rehabilitation with a motivated patient.^[3] Advances in modern microsurgical technology and a clearer understanding of tissue healing in response to trauma have resulted in a reasonably predictable success rate for the operation following replantation of an amputated extremity.^[7] The ongoing results are however extremely reliant on the postoperative hand therapy.

Due to the significant consequence of a loss of an upper limb, replantation of the amputated limb is often attempted. The first successful replantation of an upper extremity was per-

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formed in 1962 by Malt and McKhann in Boston.^[2] Since this first successful replantation, a large number of replantation procedures have been performed. It has been proposed that the practice is now so ingrained in society that amputated body parts of any size or condition nearly always accompany the injured patient to the hospital with the hope they can be replanted.^[8]

The decision making process for attempting a replantation by clinicians is difficult. The decision needs to take into account the patient's general health status, limb ischemia time, and the level, type, and extent of tissue damage.^[9] The important function of the hand for ADLs has led to replantation of amputated hands and forearms to be considered an absolute indication for surgery. Contraindications for replantation also exist. These are mainly if the patient has major life threatening injuries which take priority over the limb replantation. An important contraindication proposed by some authors is a severe mental health condition. This is because favourable outcomes after replantation require intensive postoperative rehabilitation with a compliant patient. Severe mental health conditions can often limit this process.^[2,5,9] For example, a delusion or bizarre belief regarding the hand may have precipitated the self-mutilation and, if the delusion is still held, such a belief may prohibit the patient consenting to the replantation and participating in the rehabilitation process.

We present a case of a self-inflicted traumatic hand amputation associated with an acute psychotic episode. The case highlights the successful application of advanced trauma life support principles, discusses the principles of gaining consent in a psychotic patient and demonstrates how timely communication between patients, multiple medical teams over multiple sites can lead to good outcomes for patients.

2. CASE PRESENTATION

We present the case of a 22-year-old man who presented to the emergency department in a psychotic state following a self-mutilation amputation of his left (non-dominant) hand. He had used a drop saw to amputate his hand (see Figure 1). His father witnessed the incident and applied a belt tourniquet immediately to the severed limb. The hand was cleaned immediately and placed on ice. An ambulance arrived 15 minutes after the incidence and applied a formal tourniquet and transported the patient to the nearest trauma centre. Minimal blood was lost. A wet dressing and pressure bandage was applied by the paramedics.

The patient was stabilised in the emergency department and was reviewed by the trauma, orthopaedic and vascular surgery teams. He underwent a primary and secondary survey. No other injuries were identified. He was initially

treated with analgesia and had a tetanus booster.



Figure 1. Amputated left hand

The patient was discussed with the Hand Hospital who recommended plain X-rays of the hand and wrist, intravenous antibiotics, elevation and pressure bandage to the limb and immediate transfer to the hand hospital for definitive management.

The patient's past medical history included previous episode of psychosis following amphetamine abuse and several suicide attempts, the most serious by jumping in front of a train in which he sustained a traumatic brain injury. For his mental health issues he was currently under the care of a private psychiatrist who had prescribed citalopram (10 mg daily) and risperidone (2 mg twice daily).

Investigations: Radiographs demonstrated an amputation through the distal radius and ulna. Figure 2 and Figure 3 show radiographs of the amputated hand.

Treatment: After stabilization, the patient was transferred to a specialized hand hospital. He underwent emergency replantation of his left hand as all major structures were seen and felt to be viable. He was admitted under the orthopedic and mental health teams.



Figure 2. Anteroposterior radiograph of the amputated left hand



Figure 3. Anteroposterior radiograph of the amputated left wrist



Figure 4. Radiograph of replanted left hand

Outcome and follow-up: The patient had a successful replantation of his left hand (see Figure 4). He underwent several months of physical and mental rehabilitation. At the time of discharge, he was able to perform simple tasks with his hand. He was also started on depot risperidone injections every 2 weeks under a community order and was linked in with the community mental health team.

3. DISCUSSION

Major amputations of the upper extremity result in devastating scenarios for the patient, their family and friends and are a major burden on the health economy. Even in large trauma centers, patients with isolated major upper limb amputations are rare, which may explain the small body of literature.^[2] In most cases, these injuries are associated with trauma and hence are associated with other life-threatening injuries. For these cases, damage-control surgery is generally applied to save the patient's life, resulting in no attempt of replantation of the limb.^[1,2,9] The case above is a different scenario as the patient has a single injury, which was relatively clean with all of the anatomical structures preserved due to the mechanism of the injury.

With a hand amputation being the only injury, consideration for replantation of the limb is very important as loss of a limb is a devastating injury for the individual and is a huge cost burden to society.^[1] This case presents two interesting discussion points. Firstly, should severe mental health problems be a contraindication to surgery? Secondly, how is informed consent from the mentally ill patient attained? Our case showed a successful replantation of the hand. It needs to be noted that in some literature severe mental health is a contraindication for replantation. Although repeat major self-mutilation has been reported, it does appear to be uncommon. Hence, emergency limb replantation can be justified in

the presence of severe psychosis that may render the patient incapable of informed consent.^[5,6] The decision to operate on our patient was attained after an in-depth conversation with the patient and his parents with the treating team.

Consent was gained from the patient and his parents who are his guardians. It was felt that the he guardians had significant insight into his current condition and were aware of the risks if he did not engage in rehabilitation. Although the patient suffered from episodes of psychosis and a traumatic brain injury his parents stated that he functions mentally at an age appropriate level and is usually well managed from a mental health point of view. This was evident as he was engaged in ongoing mental health review by a private psychiatrist. The psychiatrist was contacted who stated that he normally functions well and had never had any delusions regarding body parts in the past.

The final decision to operate by the treating team was difficult. The team tried to assess the patient's potential ability to engage in post-operative rehabilitation. A discussion was had between the patient, the guardians and over the phone to the patient's psychiatrist. Although it was not known if he fully understood the importance of his post-operative management at the time it was felt by the treating team that replantation of the limb was reasonable, as the patient had previously been functioning well with adequate medication and psychological support. The decision had to be made quickly as replantation of the limb is time critical. The patient and guardians were informed and understood that post-operatively he would need months of mental health and physical rehabilitation as an

inpatient. They were willing to go ahead with the surgery.

Post operatively the patient progressed well. He was admitted to a hospital that could both treat his ongoing needs for physical rehabilitation and also mental health assessment. He underwent a medication review and with his medications changed to depot risperidone injections. The choice of depot injections was done to ensure compliance. His dosage was adjusted during his hospital stay. He also underwent regular psychological assessments to ensure he was improving from his mental health issues and that he was remaining motivated in his physical rehabilitation.

During his 3-month hospital stay he underwent extensive hand physiotherapy and rehabilitation. The hand therapy allowed him to regain strength, function and flexibility in the affected non-dominant hand. Prior to discharge he was able to perform simple tasks with his affected hand. The patient was discharged from hospital into the care of his parents. He is still engaged in weekly hand rehabilitation and is seen by his psychiatrist as well as the community mental health team regularly. He is progressing well.

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The first Author, Dr Samuel Davies, is a surgical registrar at St George Hospital, Sydney, Australia. He was the main contributor to this case. The second Author, Dr Matthew Doyle, is a surgical registrar at St George Hospital, Sydney, Australia. He was involved in editing the case report.

CONFLICTS OF INTEREST DISCLOSURE

The authors declare that no conflicts of interest exist.

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